



### Temperature Sensor

Weed Instrument Company, Inc., Elgin, Texas, produces a line of thermocouples—temperature sensors—for a variety of industrial and research uses. One of the company's newer products is a thermocouple specially designed for high accuracy at extreme temperatures—above 3,000 degrees Fahrenheit. It contributed to solution of a problem encountered by Westinghouse Electric Corporation's Advanced Coal Conversion Department, Madison, Pennsylvania, which develops systems for converting coal to cleaner and more efficient forms of energy. The problem was the difficulty of obtaining precise measurement of the very high temperatures involved in the conversion process; the Westinghouse group experienced many thermocouple failures because of severe temperature changes resulting from the sensors' alternating exposure to hot flame and cold purge gas, and because of sensor-degrading chemical reactions occurring at temperatures sometimes exceeding 2,200 degrees.

The Westinghouse remedy was design of a new thermocouple/thermowell assembly which incorporates Weed Instrument's high-temperature sensor. The assembly is used to acquire test data on the combustion process within such facilities as the coal gasification pressure vessel shown in the accompanying photo. The assembly is the equipment extending outward from the bolted hatch; encased within the tubular element and extending into the pressure vessel, the Weed thermocouple reports internal temperature.

Development of the Weed Instrument sensor was aided by technical information supplied by Lewis Research Center. Lewis provided several reports based on the Center's own investigations of materials subjected to very high temperatures and this information contributed to the thermocouple's ability to withstand extreme temperatures. Introduction of this product brought substantial increases in Weed Instrument's sales and employment.